

CLAIMS:

1. A hearing aid adapted for use in the ear canal of a user comprising:
 - a) a plate member with a plurality of hearing aid components mounted thereto, said components including at least a battery, microphone, amplifier and speaker;
 - 5 b) a soft polymeric body that is bonded to the plate member and including a supporting interface portion comprised of soft-solid polymeric material that is of sufficient thickness to closely conform to both the ear canal and at least one of the components;
 - c) the soft polymeric body and components defining a soft structure
 - 10 compliant to the ear canal during use, and that is substantially solid and free of void spaces between at least one of the components and the ear canal;
 - d) the combination of the soft compliant structure and encapsulated hearing aid component minimizing feedback;
 - e) the hearing aid components including a wiring harness that interfaces with
 - 15 multiple electronic hearing aid components, said wiring harness being multiple stainless steel wires that form a multi-strand cable of multiple slatted stainless steel wires, the cable being coated with a bio-compatible insulation.
2. The hearing aid of claim 1 wherein the plate member has opposing generally flat sides including a medial side and a lateral side, and the hearing aid
- 20 components are mounted to extend medially from the medial side.
3. The hearing aid of claim 1 wherein the plate member is generally circular in shape.
4. The hearing aid of claim 1 wherein the components include electronic hearing aid components and the plate member carries a number of controls for the
- 25 electronic components on the lateral side of the plate member.
5. The hearing aid of claim 1 wherein a bonding enhancer forms an interface between the soft polymeric body and the plate member.
6. The hearing aid of claim 1 wherein the soft polymeric body includes silicone.
- 30 7. The hearing aid of claim 1 wherein the soft polymeric body includes silicone with a hardness of between 3 and 40 Durometer Shore A.
8. The hearing aid of claim 1 wherein the plate member is acrylic.

9. The hearing aid of claim 7 wherein the plate member is acrylic.
10. The hearing aid of claim 1 wherein the soft polymeric body has a hardness of between about 10 and 35 Durometer Shore A.
11. The hearing aid of claim 1 wherein the soft polymeric body anatomically
5 fits the contours of the ear canal.
12. A hearing aid adapted for use in the ear canal of a user comprising;
- a) a mounting member having medial and lateral side portions, the medial side supporting a plurality of hearing aid components;
- b) a soft polymeric body is of bondable silicone that is joined to the mounting
10 member and which encapsulates a plurality of the hearing aid components, the body shaped to closely conform the ear canal of a user;
- c) the soft polymeric body and encapsulated hearing aid components defining an interface portion comprised of a soft structure compliant to the ear canal during use, the soft polymeric body of sufficient thickness to closely conform to both the ear canal
15 and at least one of the components being;
- d) the combination of the soft compliant structure and encapsulated electronic hearing aid components minimizing acoustic leakage; and
- e) a wiring harness that links multiple of the components, the harness being a multi-strand stainless steel cable of plated strands and covered with a bio-compatible
20 insulation coating.
13. A hearing aid adapted for use in the ear canal of a user comprising:
- a) a plastic mounting member supporting a plurality of connected electronic hearing aid components, the mounting member having medial and lateral surface portions;
- 25 b) a soft polymeric body that is bonded to the plastic mounting member medial surface portion, and which encapsulates at least some of the electronic hearing aid components, the body being shaped to conform to the ear canal of a user;
- c) the soft polymeric body and encapsulated electronic hearing aid components defining a soft structure compliant to the user's ear canal during use, and that
30 is substantially solid and free of void spaces;
- d) wherein the soft polymeric body defines an interface portion of sufficient thickness to closely conform to both the ear canal and one of the components; and

e) a wiring harness that links multiple of the components, the harness being a multi-strand stainless steel cable of multiple plated strands and covered with a bio-compatible insulation coating.

14. The hearing aid of claim 13 wherein the soft polymeric body includes
5 silicone.

15. The hearing aid of claim 13 wherein the soft polymeric body has a hardness of between about 10 and 35 Durometer Shore A.

16. The hearing aid of claim 1 wherein the mounting member is acrylic.

17. The hearing aid of claim 1 further comprising a wiring harness that
10 interconnects some of the electronic components and a load carrying member for preventing at least some transfer of tensile load to the wiring harness.

18. The hearing aid of claim 17 wherein the load carrying member provides longitudinal stability.

19. The hearing aid of claim 18 wherein the load carrying member is the vent
15 tube.

20. The hearing aid of claim 13 wherein the electronic components include a multiple S-loop wiring harness.

21. The hearing aid of claim 13, sized to fit completely in the ear canal of the user.

22. The hearing aid of claim 1, sized to fit completely in the ear canal of the user.
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23. The hearing aid of claim 12, sized to fit completely in the ear canal of the user.

24. The hearing aid of claims 1, 12 or 13 wherein the overall diameter of the
25 coated wire cable is about 0.13 millimeters.

25. The hearing aid of claims 1, 12 or 13 wherein the uncoated diameter of the multi-strand cable is about 0.08 millimeters.

26. The hearing aid of claims 1, 12 or 13 wherein the overall coated diameter is between about 0.025 millimeters and 0.18 millimeters for the multi-stranded cable.

27. The hearing aid of claims 1, 12 or 13 wherein the overall uncoated
30 diameter of the multi-strand cable is between about 0.013 and 0.025 millimeters.

28. The hearing aid of claims 1, 12 and 13 wherein the coating has a thickness

of about 0.001 inches.

29. The hearing aid of claims 1, 12 and 13 wherein the coating has a thickness of between about 0.0001 and 0.004 inches.

5 30. The hearing aid of claims 1, 12 or 13 wherein the strands of the multi-strand cable are coated with silver.

31. The hearing aid of claims 1, 12 or 13 wherein the strands of the multi-strand cable are coated with gold.

32. The hearing aid of claims 1, 12 or 13 wherein the strands of the multi-strand cable are plated with a plating that enables the wire to be soldered.

10 33. The hearing aid of claims 1, 12 or 13 wherein the coating material is a bio-compatible coating selected from the group that includes teflon, ETFE and PTFE.

34. The hearing aid of claims 1, 12 or 13 wherein the plating is a copper flash coating.

15 35. The hearing aid of claims 1, 12 or 13 wherein the individual wires of the multi-strand wire are each plated.

36. The hearing aid of claims 1, 12 or 13 wherein the overall multi-strand wire is coated with insulation.

37. The invention(s) substantially as shown and described herein.